Algebra 2 Honors Summer Packet

Dear Student,

Welcome to Sayreville War Memorial High School and your math course for the year! There is much to learn this year, and each class session during school will require students to work diligently, both during and outside of class. This summer Math packet addresses the material that you should be comfortable with before the start of **Algebra 2 Honors**. This Math packet serves 2 purposes:

1) It will allow you to remain mathematically fresh during the summer and

2) It will enable you to "hit the ground running" when this course begins.

This packet should be completed and brought with you on the first day of school. Use the answer key provided to check your work. If you come across questions that you are unsure of, make note and bring that up to your teacher during the review. It would be a mistake to complete this packet immediately upon the completion of this past school year as well as waiting until just before the next school year begins. Take some time off and look towards beginning the packet come mid-summer. It is important that the techniques practiced in this packet are fresh in your mind come the first day of school.

You will be assessed on this content within the first week or so of school.

Good luck!

Sincerely, Mrs. Kruh (mary.kruh@sayrevillek12.net) and Ms. Kerney (nichole.kerney@sayrevillek12.net)

Name:_____

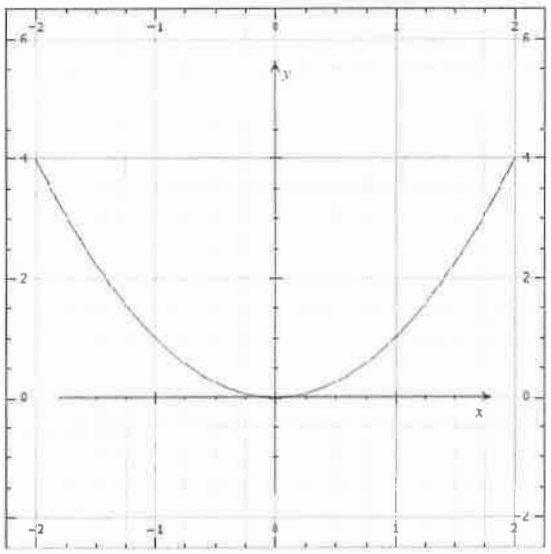
Name _____ Algebra II Honors Summer Packet

Please **show all work** on a separate piece of loose leaf to receive full or partial credit. Please write final answers on answer line. Please read directions carefully.

Relations, Functions, Function Notation, Linear Equations and Functions

Questions 1 and 2: Determine whether each relation is a function. State its domain and range

1)

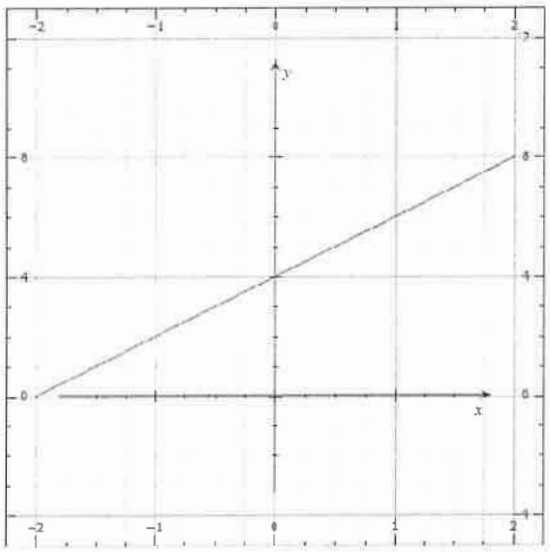


1) Function? Yes or No? _____

1) Domain: _____

1) Range: _____

2)



2) Function? Yes or No? _____

2) Domain: _____

2) Range: _____

Questions 3-5: Find each value if $f(x)=10x+3x^2$ and $g(x)=5x^2-8x$ and $h(x)=\frac{1}{x}$.

3) $f(-6)$ 3) _____

4) $g(a^2)$ 4) _____

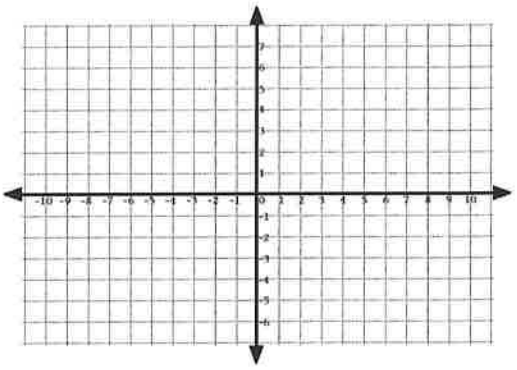
5) $h(0)$ 5) _____

6) Write the equation $\frac{2}{5}x-8=7y$ in standard form, and identify A, B, and C. (Hint: Standard Form is $Ax+By=C$, where A, B, and C are integers, and $A\geq 0$.) 6) _____

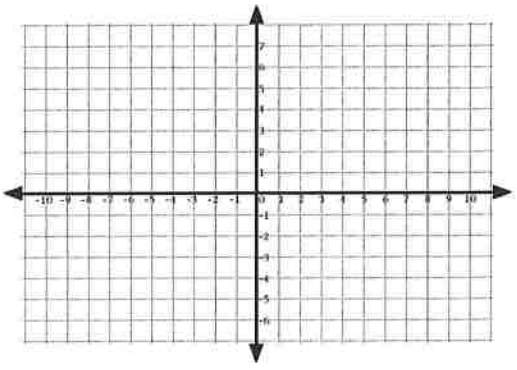
7) Find the x-intercept and the y-intercept of the graph of $2y=3x-6$ 7) _____

For Questions 8-9, graph each equation.

8) $y-4x=2$ 8)



9) $x=2$ 9)

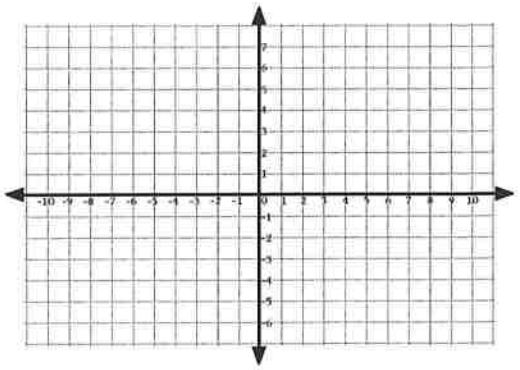


10) Find the slope of a line that passes through $(9,-7)$ and $(-1,-2)$.

10) _____

11) Graph the line passing through $(5,6)$ perpendicular to the graph of $y=-3$.

11)



12) Write the equation in slope-intercept form for the line that has a slope of 3 and passes through the point $(1,-5)$.

12) _____

13) Write an equation in slope-intercept form for the line that passes through $(-2,3)$ and is parallel to the line whose equation is $2x+3y=6$.

13) _____

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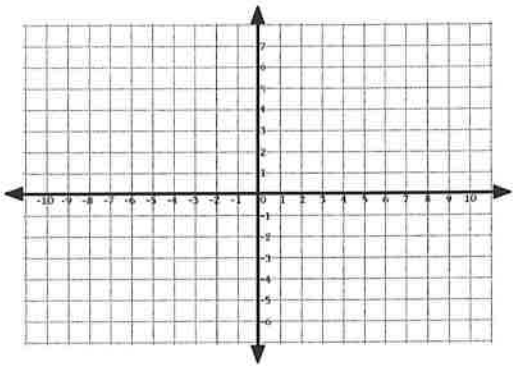
Systems of Equations and Inequalities

For Questions 1-2, solve each system of equations by graphing.

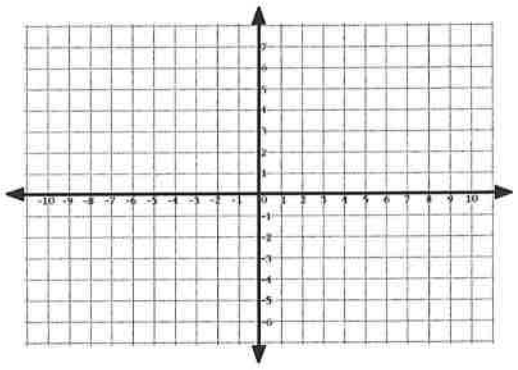
1) $\begin{aligned} x+2y&=6 \\ 2x+y&=9 \end{aligned}$

1) Solution is: _____



2) $\begin{aligned} \frac{1}{4}x+2y&=5 \\ 2x-y&=6 \end{aligned}$

2) Solution is: _____



For Questions 3 and 4, solve each system by substitution.

3) $\begin{aligned} y&=3x-4 \\ y&=4+x \end{aligned}$

3) _____

4) $\begin{aligned} 4c+2d&=10 \\ c+3d&=10 \end{aligned}$

4) _____

For Questions 5 and 6, solve each system by elimination.

5) $\begin{cases} x - y = -9 \\ 7x + 2y = 9 \end{cases}$

5) _____

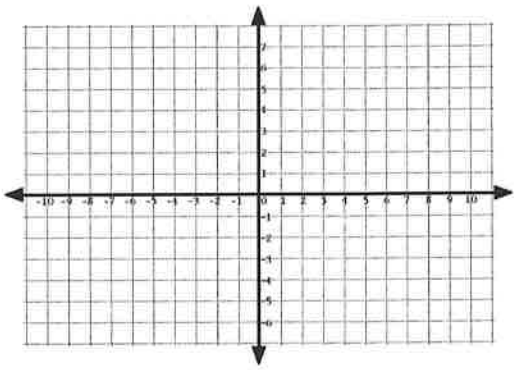
6) $\begin{cases} 4x - 5y = 17 \\ 3x + 4y = 5 \end{cases}$

6) _____

For Questions 7-8, solve each system of inequalities by graphing.

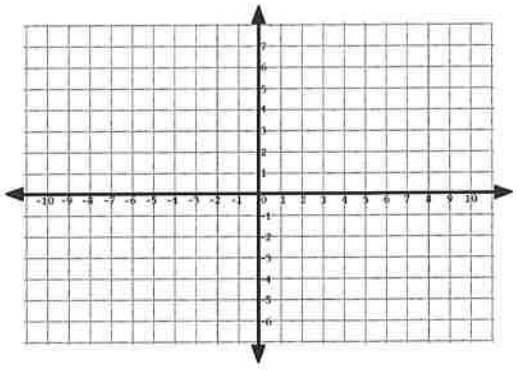
7) $\begin{cases} y < 2 - x \\ y > x + 4 \end{cases}$.

7)



8) $\begin{cases} 3x + 2y \geq 6 \\ 4x - y \geq 2 \end{cases}$.

8)



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Rules of Exponents, Operations on Polynomials, and Factoring Polynomials

For Questions 1-5, simplify completely.

1) $(2x)(5x)$ 1) _____

2) $(3x)^2$ 2) _____

3) $\left(\frac{x^2}{y^3}\right)^2$ 3) _____

4) $\left(\frac{x^2}{y^3}\right)^{-2}$ 4) _____

5) $\left(\frac{3a^{-5}x^2}{b^{-6}y^3}\right)^0$ 5) _____

For Questions 6-9, perform the indicated operation.

6) $(2x^3+3x^2)+(7x^3-2x^2)$ 6) _____

7) $(2x^3+3x^2)-(7x^3-2x^2)$ 7) _____

8) $(2x^3+3x^2)(7x^3-2x^2)$ 8) _____

9) $(2x+y)^2$ 9) _____

For Questions 10-19, factor each polynomial completely.

10) $7x^2 - 14x$ 10) _____

11) $21x^3 - 18x^2y^2 + 24xy^2$ 11) _____

12) $c^2 - 100$ 12) _____

13) $d^2 - 12d + 36$ 13) _____

14) $y^2 + 18y + 81$ 14) _____

15) $a^2 + 7a - 18$ 15) _____

16) $b^2 + 8b + 7$ 16) _____

17) $2x^2 - 3x - 5$ 17) _____

18) $4z^2 + 4z - 15$ 18) _____

19) $2ak + k - 6a - 3$ 19) _____

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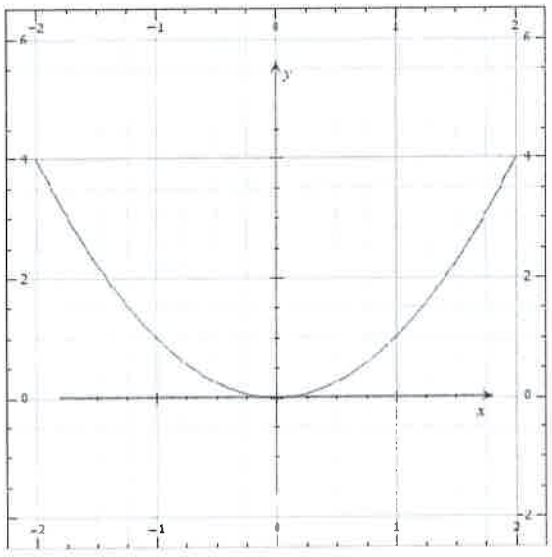
Relations, Functions, Function Notation, Linear Equations and Functions

Questions 1 and 2: Determine whether each relation is a function. State its domain and range

1)

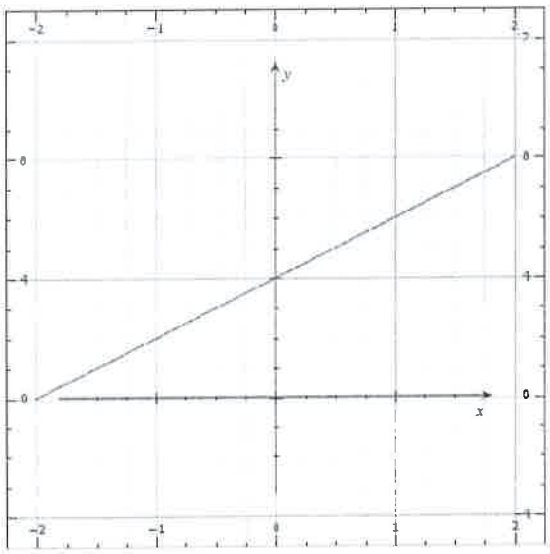


1) Function? Yes or No? Yes

1) Domain: $\mathbb{R}$ or $(-\infty, \infty)$

1) Range: $y \geq 0$ or $[0, \infty)$

2)



2) Function? Yes or No? Yes

2) Domain: $\mathbb{R}$ or $(-\infty, \infty)$

2) Range: $\mathbb{R}$ or $(-\infty, \infty)$

Ken

Questions 3-5: Find each value if $f(x)=10x+3x^2$ and $g(x)=5x^2-8x$ and $h(x)=\frac{1}{x}$.

3) $f(-6)$ 3) $f(-6)=48$

4) $g(a^2)$ 4) $g(a^2)=5a^4-8a^2$

5) $h(0)$ 5) undefined

6) Write the equation $\frac{2}{5}x-8=7y$ in standard form, and identify A, B, and C. (Hint: Standard Form is $Ax+By=C$, where A, B, and C are integers, and $A\geq 0$.)

6) $2x-35y=40$
$A=2 \quad B=-35 \quad C=40$

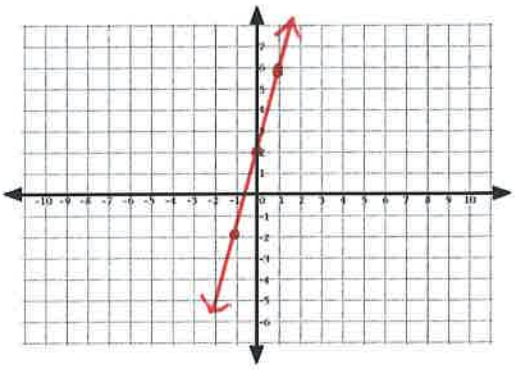
7) Find the x-intercept and the y-intercept of the graph of $2y=3x-6$

7) x-int. $=2$
y-int. $=-3$

For Questions 8-9, graph each equation.

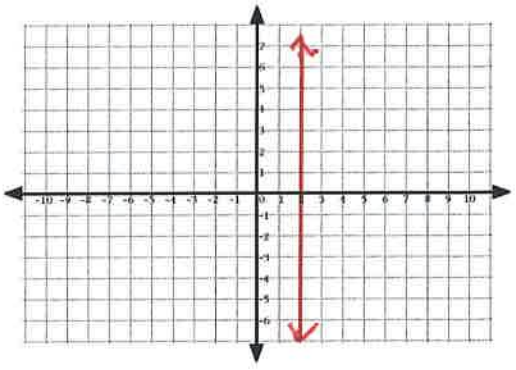
8) $y-4x=2$

8)



9) $x=2$

9)



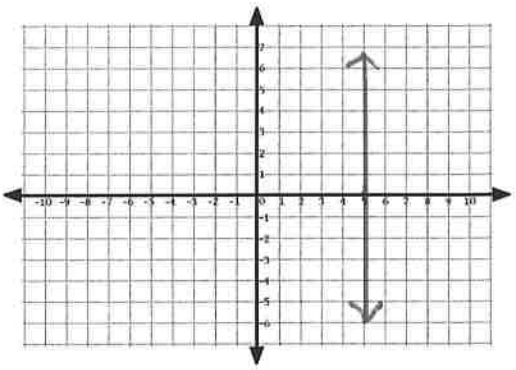
Key

10) Find the slope of a line that passes through $(9,-7)$ and $(-1,-2)$.

10) $m = \frac{-1}{2}$

11) Graph the line passing through $(5,6)$ perpendicular to the graph of $y=-3$.

11)



12) Write the equation in slope-intercept form for the line that has a slope of 3 and passes through the point $(1,-5)$.

12) $y = 3x - 8$

13) Write an equation in slope-intercept form for the line that passes through $(-2,3)$ and is parallel to the line whose equation is $2x+3y=6$.

13) $y = \frac{-2}{3}x + \frac{5}{3}$

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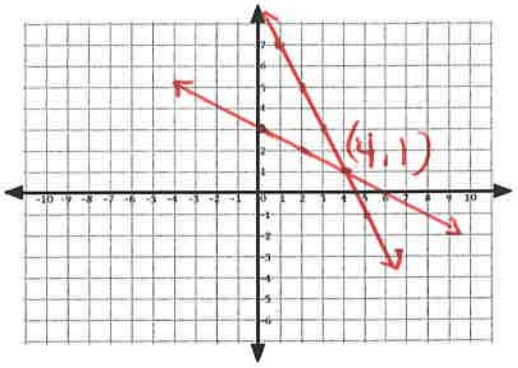
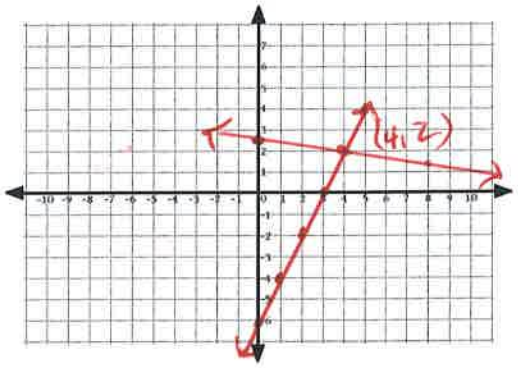
1) $\begin{cases} x+2y=6 \\ 2x+y=9 \end{cases}$.

1) Solution is: (4, 1)



2) $\begin{cases} \frac{1}{4}x+2y=5 \\ 2x-y=6 \end{cases}$.

2) Solution is: (4, 2)



For Questions 3 and 4, solve each system by substitution.

3) $\begin{cases} y=3x-4 \\ y=4+x \end{cases}$

3) (4, 8)

4) $\begin{cases} 4c+2d=10 \\ c+3d=10 \end{cases}$

4) (1, 3)

Key

For Questions 5 and 6, solve each system by elimination.

5) $\begin{cases} x - y = -9 \\ 7x + 2y = 9 \end{cases}$

5) $(-1, 8)$

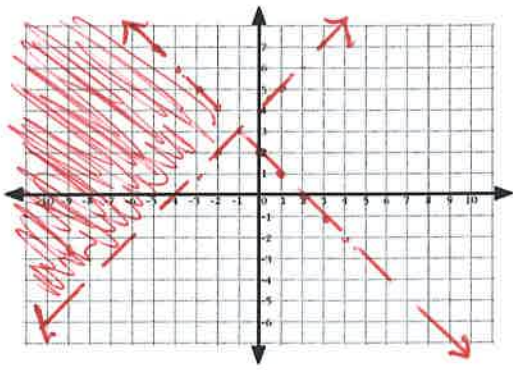
6) $\begin{cases} 4x - 5y = 17 \\ 3x + 4y = 5 \end{cases}$

6) $(3, -1)$

For Questions 7-8, solve each system of inequalities by graphing.

7) $\begin{cases} y < 2 - x \\ y > x + 4 \end{cases}$

7)



8) $\begin{cases} 3x + 2y \geq 6 \\ 4x - y \geq 2 \end{cases}$

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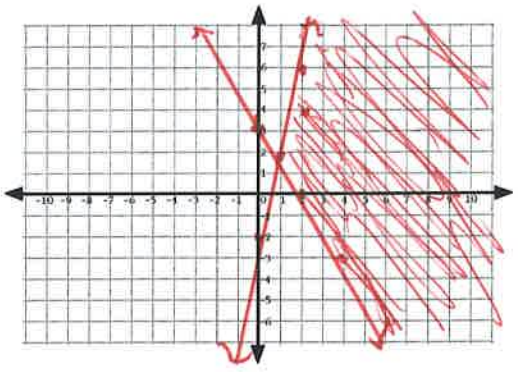

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Rules of Exponents, Operations on Polynomials, and Factoring Polynomials

For Questions 1-5, simplify completely.

1) $(2x)(5x)$ 1) $10x^2$

2) $(3x)^2$ 2) $9x^2$

3) $\left(\frac{x^2}{y^3}\right)^2$ 3) $\frac{x^4}{y^6}$

4) $\left(\frac{x^2}{y^3}\right)^{-2}$ 4) $\frac{y^6}{x^4}$

5) $\left(\frac{3a^{-5}x^2}{b^{-6}y^3}\right)^0$ 5) 1

For Questions 6-9, perform the indicated operation.

6) $(2x^3+3x^2)+(7x^3-2x^2)$ 6) $9x^3+x^2$

7) $(2x^3+3x^2)-(7x^3-2x^2)$ 7) $-5x^3+5x^2$

8) $(2x^3+3x^2)(7x^3-2x^2)$ 8) $14x^6+17x^5-6x^4$

9) $(2x+y)^2$ 9) $4x^2+4xy+y^2$

Key

For Questions 10-19, factor each polynomial completely.

10) $7x^2 - 14x$ 10) $7x(x-2)$

11) $21x^3 - 18x^2y^2 + 24xy^2$ 11) $3x(7x^2 - 6xy^2 + 8y^2)$

12) $c^2 - 100$ 12) $(c+10)(c-10)$

13) $d^2 - 12d + 36$ 13) $(d-6)^2$

14) $y^2 + 18y + 81$ 14) $(y+9)^2$

15) $a^2 + 7a - 18$ 15) $(a+9)(a-2)$

16) $b^2 + 8b + 7$ 16) $(b+7)(b+1)$

17) $2x^2 - 3x - 5$ 17) $(2x-5)(x+1)$

18) $4z^2 + 4z - 15$ 18) $(2z-3)(2z+5)$

19) $2ak + k - 6a - 3$ 19) $(2a+1)(k-3)$